CONSTRUCTION DRAWINGS

MONTANA FISH, WILDLIFE AND PARKS
REGION 4 HEADQUARTERS
WATER SYSTEM MODIFICATION AND WASTEWATER SYSTEM REPLACEMENT

GREAT FALLS, MONTANA

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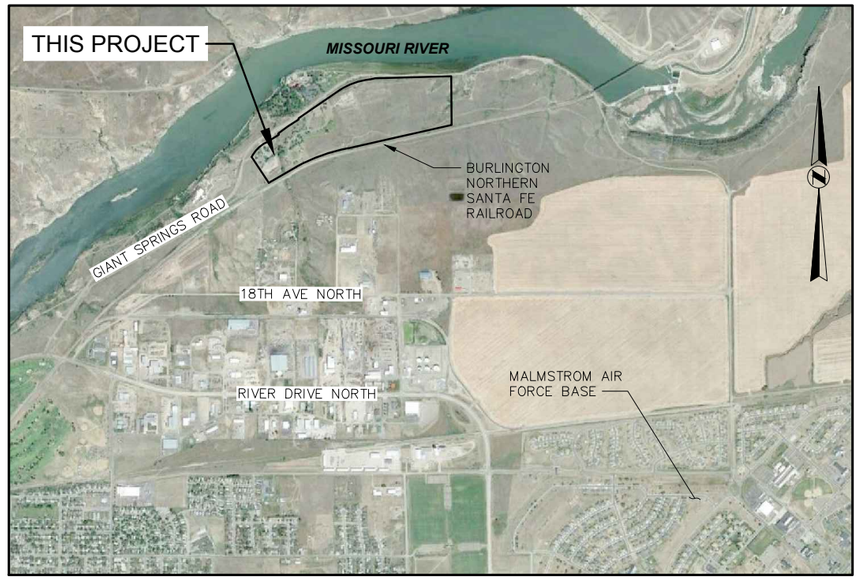

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MT FWP REGION 4 HEADQUARTERS
SPARK ARCHITECTURE GREAT FALLS, MT

TITLE SHEET

DESIGNED: PDH
DRAWN: PDH
DATE: 1/15/2019

SHEET
T1.0

TECHNICAL SPECIFICATIONS

ALL WORK SHALL BE DONE IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS (MPWSS) 6TH EDITION AND THE MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY CIRCULARS

SOME ITEMS OF MPWSS ARE HIGHLIGHTED FOR IMPORTANCE BELOW. TECHNICAL SPECIFICATIONS ARE AMENDED TO INCLUDE THE NOTES BELOW:

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT
SECTION 01090 REFERENCES
SECTION 01300 SUBMITTALS
SECTION 01400 CONTRACTOR QUALITY CONTROL & OWNER QUALITY ASSURANCE
1. QUALITY CONTROL SUBMITTALS AND TESTING REQUIREMENTS ARE SHOWN ON THIS SHEET.
SECTION 01500 CONSTRUCTION AND TEMPORARY FACILITIES
SECTION 01570 CONSTRUCTION TRAFFIC CONTROL
SECTION 02221 TRENCH EXCAVATION AND BACKFILL FOR PIPELINES AND APPURTENANT STRUCTURES
1. TRENCH BACKFILL SHALL BE TYPE A.
2. BEDDING MATERIAL SHALL BE CLEAN AGGREGATE, WITH A MINIMUM OF 90% RETAINED ON A #4 SIEVE.
SECTION 02230 STREET EXCAVATION, BACKFILL AND COMPACTION
SECTION 02234 SUB BASE COURSE
1. SUB BASE COURSE SHALL BE 4" MINUS.
SECTION 02235 CRUSHED BASE COURSE
1. CRUSHED BASE COURSE SHALL BE ¾" MINUS.
SECTION 02502 ASPHALT PRIME AND/OR TACK COAT
SECTION 02510 ASPHALT CONCRETE PAVEMENT
1. SURFACE COURSE AGGREGATE SHALL BE TYPE B.
2. ASPHALT BINDER MATERIAL SHALL BE (PGAB) PG 58-28
SECTION 02528 CONCRETE CURB AND GUTTER
SECTION 02529 CONCRETE SIDEWALKS, DRIVEWAYS, APPROACHES, CURB TURN FILLETS, VALLEY GUTTERS AND MISCELLANEOUS NEW CONCRETE CONSTRUCTION
1. CONCRETE SHALL BE M-4000.
2. CONCRETE SIDEWALKS SHALL BE REINFORCED WITH 1.5 POUNDS OF FIBER MESH PER CUBIC YARD
SECTION 02660 WATER DISTRIBUTION SYSTEMS
SECTION 02720 STORM DRAIN SYSTEMS
SECTION 02725 DRAINAGE CULVERT
SECTION 02730 SANITARY SEWER COLLECTION SYSTEM
SECTION 02910 SEEDING
SECTION 02920 HYDRAULIC SEEDING

SANITARY SEWER SYSTEM NOTES

1. PROVIDE A MINIMUM OF 6 FEET OF COVER FOR THE SANITARY SEWER FORCEMAIN AND 3 FEET OF COVER FOR ALL SANITARY SEWER SERVICES UNLESS SPECIFIED OTHERWISE. PROVIDE 4" OF INSULATION IF THESE REQUIREMENTS CANNOT BE MET.
2. UPON SUCCESSFUL LEAKAGE TESTING OF SEWER FORCEMAIN AND CONCRETE STRUCTURES THE NEW SERVICES CAN BE INSTALLED.
3. PROPOSED LOCATIONS OF SANITARY SEWER SERVICES AS SHOWN ON THE PLANS ARE APPROXIMATE AND MAY NEED TO BE ADJUSTED IN THE FIELD. CONTRACTOR AND ENGINEER ARE TO CONFIRM CONNECTION POINTS TO BUILDING SEWERS PRIOR TO CONDUCTING INSTALLATION OF EACH SANITARY SEWER SERVICE LINE.
4. HDPE PIPE SHALL BE FUSED PER THE MANUFACTURER'S SPECIFICATIONS.
5. DIMENSIONS, LOCATIONS, CONFIGURATION OF SUBSURFACE STRUCTURES ARE ASSUMED BASED ON EXISTING AVAILABLE INFORMATION AND ARE CONSIDERED APPROXIMATE. FIELD VERIFY AND COORDINATE WITH ENGINEER PRIOR TO CONSTRUCTION.
6. SEWER SERVICES TO BE CONSTRUCTED IN ACCORDANCE WITH SECTION 2730 AND STANDARD DRAWINGS 02730-2&3 OF MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS. SEWER SERVICE PIPE SIZE SHALL BE PVC SDR 35 AND MATCH EXISTING SEWER SERVICE SIZE.
7. PRIOR TO CONSTRUCTION OF SEWER SERVICES EXPOSE PROPOSED CONNECTION POINT TO VERIFY LOCATION, CONDITION, AND GRADE.
8. SEWER SERVICES TO BE INSTALLED BY A LICENSED PLUMBER IN ACCORDANCE WITH PLUMBING CODES. CLEANOUTS TO BE PROVIDED AT CONNECTION TO EXISTING SEWER. WHERE SEWER SERVICE LENGTH EXCEEDS 100', ADDITIONAL CLEANOUTS ARE REQUIRED EVERY 100'. CLEANOUTS ALSO REQUIRED FOR ANGLES GREATER THAN 22.5', AND AT CHANGES IN PIPE GRADE.

CONSTRUCTION NOTES

1. THE LOCATION OF EXISTING UNDERGROUND UTILITIES AND/OR FACILITIES ARE DEPICTED BASED ON INFORMATION PROVIDED BY OTHERS AND SHOULD BE CONSIDERED APPROXIMATE. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.
2. PRIOR TO ANY EXCAVATION, THE CONTRACTOR IS RESPONSIBLE FOR LOCATING, OR HAVING LOCATED, ALL UNDERGROUND FACILITIES SHOWN OR INDICATED IN THE PLANS AND/OR CONTRACT DOCUMENTS. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN EXCAVATING NEAR UNDERGROUND FACILITIES.
3. ANY DAMAGE TO ABOVE OR BELOW GROUND UTILITIES AND/OR FACILITIES SHALL BE IMMEDIATELY REPORTED TO THE UTILITY COMPANY AND THE ENGINEER. ALL SHOWN OR MARKED UTILITIES OR FACILITIES DAMAGED BY THE CONTRACTOR OR ITS SUBCONTRACTOR SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
4. WATER LINES TO BE BURIED WITH 6.5' MINIMUM COVER BELOW FINISH GRADE.
5. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS FOR CONSTRUCTION.
6. CONTRACTOR SHALL INSTALL ADDITIONAL FITTINGS, BLOWOFFS, VALVES, ETC. AS MAY BE NECESSARY TO ADEQUATELY FLUSH, TEST, AND DISINFECT THE WATER LINES AND FITTINGS.
7. IMPROVEMENTS SHALL NOT BE COVERED UNTIL INSPECTED AND APPROVED BY THE ENGINEER.
8. CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY ITEMS DAMAGED DURING CONSTRUCTION.
9. RESTORE ALL SURFACED AREAS DAMAGED DURING CONSTRUCTION TO EQUAL OR BETTER CONDITIONS AS DETERMINED BY THE ENGINEER.
10. ALL AREAS NOT LANDSCAPED OR ANY NON-SURFACED AREAS DISTURBED DURING CONSTRUCTION ARE TO BE RESTORED TO THE ORIGINAL GRADE, PREPARED FOR SEEDING AND DRYLAND SEED APPLIED, CONTRACTOR TO PROVIDE SEED MIX FOR APPROVAL.
11. ALL EXISTING TREES TO BE PROTECTED UNLESS DIRECTED BY THE DEPARTMENT OF FISH WILDLIFE AND PARKS OR THE ENGINEER TO BE REMOVED. EXISTING TREES TO BE PROTECTED AT ALL TIMES DURING CONSTRUCTION.
12. FIELD SURVEY USED FOR PROJECT DESIGN PROVIDED BY MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS.
13. SAWCUT EXISTING CONCRETE AND ASPHALT WHERE MATCHING NEW CONSTRUCTION TO PROVIDE SMOOTH TRANSITION.

EXISTING SEPTIC TANK ABANDONMENT NOTES

1. EXISTING SEPTIC TANK IS TO BE ABANDONED AFTER NEW SEWER SERVICE IS CONNECTED.
2. ALL TANK COMPARTMENTS MUST BE FULLY PUMPED PRIOR TO ABANDONMENT.
3. EXISTING SEPTIC TANK TO BE ABANDONED IN PLACE BY CRUSHING THE TOP OF THE TANK AND PUNCTURING THE FLOOR OF THE TANK AND FILLING THE TANK WITH COMPACTED SUB-BASE GRAVEL TO WITHIN 18" OF GROUND SURFACE. TANK RISERS AND CLEANOUTS AT TANK ARE TO BE REMOVED AND UPPER 18" OF EXCAVATION BACKFILLED TO EXISTING GRADE WITH TOPSOIL.
4. EXISTING DRAINFIELD AND SEWER SERVICES ARE TO BE ABANDONED IN PLACE.

LEGEND

	EXISTING	NEW
WATER SERVICE	W	W
WATER WELL	Ⓦ	
SANITARY SEWER SERVICE LINE	SS	SS
SANITARY SEWER MANHOLE	Ⓢ	Ⓢ
STORM DRAIN	SD	
UNDERGROUND COMMUNICATION	PH PH	
UNDERGROUND NATURAL GAS	GAS GAS	
UNDERGROUND ELECTRICAL	UGE	
OVERHEAD ELECTRICAL	OHE	
CHAIN LINK FENCE		
TEST PIT	TP1	
COMMUNICATION PEDESTAL	T	
ELECTRICAL PEDESTAL/BOX	E	
LAMP POST		
POWER POLE		
CONTOURS (1 FT. INTERVALS)	4910	4913
SIGN		
GROUND SURFACE SLOPE		-4.5%
CONCRETE		
CONCRETE CURB AND GUTTER		
BUILDING OUTLINE		
EDGE OF ASHPALT		
PROPERTY BOUNDARY LINE		
PROPERTY EASEMENT		

MINIMUM QUALITY CONTROL SUBMITTALS AND TESTING REQUIREMENTS

MATERIALS SUBMITTALS REQUIRED

PRODUCT	PARTY RESPONSIBLE FOR SUBMITTAL	REQUIRED SUBMITTALS PRIOR TO MOBILIZATION	REQUIRED SUBMITTALS DURING CONSTRUCTION
WATER DISTRIBUTION MATERIALS	CONTRACTOR	MANUFACTURER'S CUT SHEETS AND PRODUCT MODEL# OR SPECIFICATIONS	SEE MATERIALS TESTING
SANITARY SEWER COLLECTION MATERIALS	CONTRACTOR	MANUFACTURER'S CUT SHEETS AND PRODUCT MODEL# OR SPECIFICATIONS	SEE MATERIALS TESTING
PRECAST CONCRETE STRUCTURES	CONTRACTOR	MANUFACTURER'S SHOP DRAWINGS AND MATERIAL SPECIFICATIONS	NONE
PIPELINE BEDDING MATERIAL	CONTRACTOR	GRADATIONS, PROCTOR, LIQUID/PLASTIC LIMITS, PLASTIC INDEX	ONE REPRESENTATIVE SAMPLE OF MATERIAL IMPORTED TO SITE
ON SITE TRENCH BACKFILL MATERIAL	CONTRACTOR	GRADATIONS, PROCTOR, LIQUID/PLASTIC LIMITS, PLASTIC INDEX	ONE REPRESENTATIVE SAMPLE FOR EACH TYPE OF MATERIAL ENCOUNTERED
SUB BASE COURSE	CONTRACTOR	GRADATIONS, PROCTOR, LIQUID/PLASTIC LIMITS, PLASTIC INDEX	ONE REPRESENTATIVE SAMPLE OF MATERIAL IMPORTED TO SITE
CRUSHED BASE COURSE	CONTRACTOR	GRADATIONS, PROCTOR, LIQUID/PLASTIC LIMITS, PLASTIC INDEX, FRACTURED FACES, WEAR	ONE REPRESENTATIVE SAMPLE OF MATERIAL IMPORTED TO SITE
ASPHALT CONCRETE PAVEMENT	CONTRACTOR	PROJECT MIX DESIGN FROM SUPPLIER	SEE MATERIALS TESTING
ASPHALT PRIME AND OR TACK COAT	CONTRACTOR	PROJECT MIX DESIGN FROM SUPPLIER	NONE
CONCRETE	CONTRACTOR	PROJECT MIX DESIGN FROM SUPPLIER	SEE MATERIALS TESTING

ON-SITE MATERIALS TESTING

PRODUCT	PARTY RESPONSIBLE TO OBTAIN TESTS	TEST FREQUENCY	TEST REQUIREMENT & STANDARD
TRENCH EXCAVATION, BACKFILL AND COMPACTION	CONTRACTOR	ONE TEST PER 200 LINEAR FEET OF TRENCH*	TEST PER AASHTO T310. OBTAIN 95% BY AASHTO T99
CRUSHED BASE COURSE	CONTRACTOR	ONE TEST PER 100 LINEAR FEET	TEST PER AASHTO T310. OBTAIN 95% BY AASHTO T99
ASPHALT CONCRETE PAVEMENT	CONTRACTOR	ONE TEST PER 100 LINEAR FEET**	93% BY ASTM D2041 PER MPWSS
CONCRETE	CONTRACTOR	ONE TEST PER POUR MIN, OR 1 TEST PER 100 C.Y.	TEMP. AIR, SLUMP, 4 CYLINDERS, PER MPWSS

*ADDITIONAL TESTS REQUIRED FOR EVERY BACKFILL MATERIAL CHANGE.

**CONTRACTOR SHALL ESTABLISH A ROLLING PATTERN EARLY IN THE PAVEMENT PROCESS BY TAKING A TEST FOR EVERY PASS AND RECORDING THE PERCENT OF MAXIMUM DENSITY. AT A MINIMUM THAT PATTERN SHALL BE MAINTAINED THROUGHOUT THE ENTIRE PROJECT.

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MT FWP REGION 4 HEADQUARTERS
SPARK ARCHITECTURE GREAT FALLS, MT

SPECIFICATIONS, NOTES & LEGEND

DESIGNED: PDH
DRAWN: PDH
DATE: 1/15/2019

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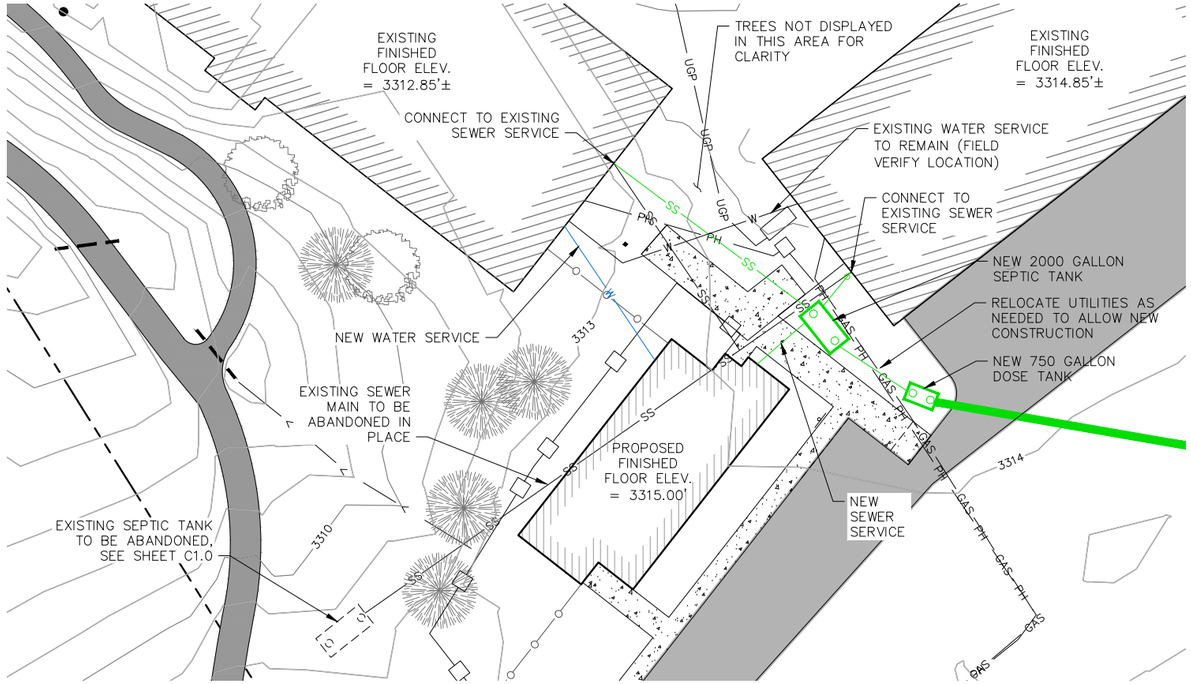
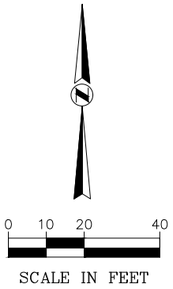
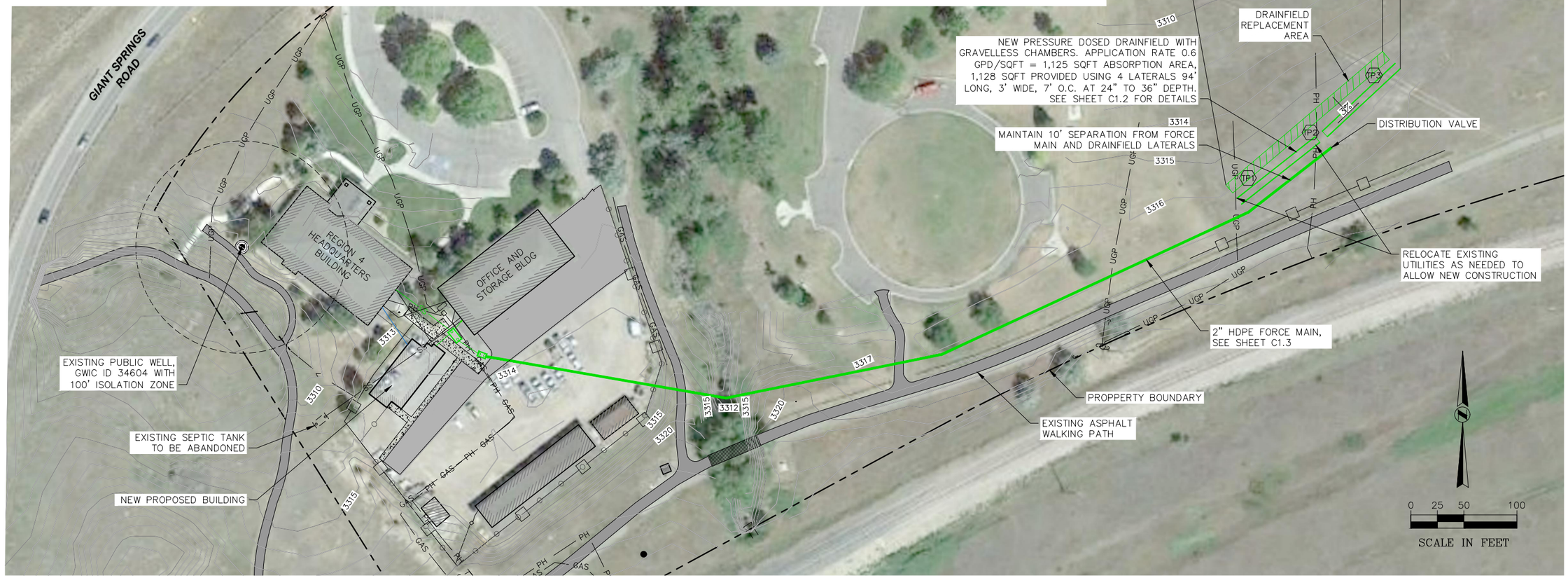


DETAILED SITE PLAN



NOTES:

1. SEPTIC TANK TO BE INSTALLED 10' MIN. FROM FOUNDATION WALLS AND 50' FROM SURFACE WATER AND WELLS. FORCEMAIN/SEALED COMPONENTS SHALL BE 50' MIN. FROM WELL.
2. BY FIELD OBSERVATION AND CONSULTATION WITH MONTANA FISH, WILDLIFE AND PARKS THERE ARE NO WELLS WITHIN 100' OF ABSORPTION FIELD OR MIXING ZONE. THERE IS NO SURFACE WATER WITHIN 100' OF THE ABSORPTION FILED, MIXING ZONE OR EXISTING WELL LOCATION.



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MT FWP REGION 4 HEADQUARTERS

SPARK ARCHITECTURE GREAT FALLS, MT

OVERALL SITE PLAN

DESIGNED: PDH
DRAWN: PDH
DATE: 1/15/2019

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DRAINFIELD AND SEPTIC SYSTEM NOTES:

1. SEPTIC TANK AND DOSE TANK DIMENSIONS ARE SHOWN BASED ON PRODUCTS FROM LOCAL SUPPLIER. DRAINFIELD IS SIZED FOR A DESIGN FLOW OF 675GPD.

2. FOR TANK DEPTHS GREATER THAN 12" USE MONOLITHIC TANKS.

3. CONTRACTOR/SUPPLIER TO TEST SEPTIC TANK & DOSE TANK FOR WATER TIGHTNESS.

4. INSTALL ABSORPTION FIELD IN THE LOCATION SHOWN ON THE SITE PLAN.

5. SLOPE ALL PIPES TO DRAIN.

6. THE FORCEMAIN SHALL BE CONSTRUCTED OUT OF FUSIBLE 2"ø HDPE PIPE DR 11 200PSI.

7. TRENCH BOTTOMS ARE TO BE LEVEL. SCARIFY THE TRENCH BOTTOM AND SIDE WALLS WITH HAND RAKE. TO AVOID DAMAGE TO NATURAL SOIL STRUCTURE, PERSONNEL OR MACHINERY SHALL NOT BE ALLOWED ON THE INFILTRATIVE SURFACE OF DRAINFIELD TRENCH.

8. THE SYSTEM IS DESIGNED TO HAVE A MAXIMUM FORCEMAIN LENGTH OF 860', AND A MAXIMUM ELEVATION HEAD OF 12', FROM THE PUMP TO THE ABSORPTION FIELD. IF EITHER OF THESE PARAMETERS WILL BE EXCEEDED, ENGINEER SHALL BE CONTACTED PRIOR TO CONSTRUCTION.

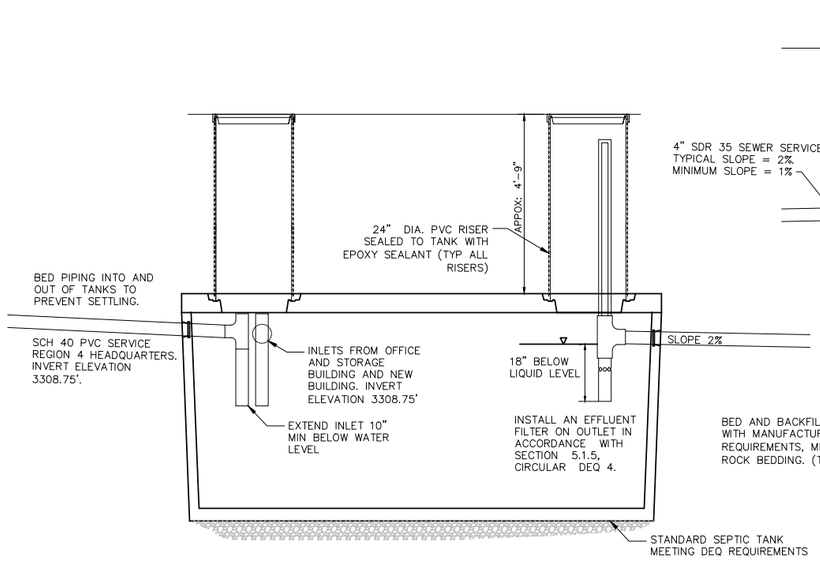
9. ORIFICES ARE 3/16" DIA., 5-0" O.C., DRILLED IN A MANNER SUCH THAT ALL BURRS ARE REMOVED WITHOUT DAMAGING THE ORIFICES. DRILL FIRST ORIFICE 2 FT FROM BEGINNING OF ABSORPTION FIELD TRENCH.

10. ORIFICES ARE TO BE POSITIONED AT 12:00. EVERY 4TH ORIFICE TO BE POINTED DOWN (6:00) WITH SPLASH PLATE TO DRAIN LATERALS.

11. ALL FLUSHING CAPS MUST BE OPEN BEFORE THE DRAINFIELD IS PRESSURIZED FOR THE FIRST TIME SO THAT DEBRIS IS PURGED FROM THE PIPING NETWORK.

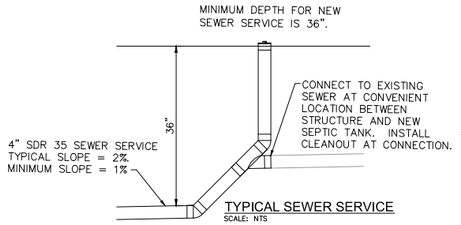
12. ENGINEER CERTIFICATION IS REQUIRED, CONTRACTOR SHALL PRESSURE TEST THE SYSTEM IN PRESENCE OF THE ENGINEER.

13. THE SEWER TRENCH BOTTOM SHOULD BE RELATIVELY SMOOTH AND FREE OF ROCK. ALL ROCKS, BOULDERS, OR LARGE STONES ENCOUNTERED WHICH MAY CAUSE POINT LOADING ON THE PIPE SHALL BE REMOVED. THE TRENCH BOTTOM PADDED USING 4-6 INCHES OF TAMPED BEDDING MATERIAL BELOW AND ON ALL SIDES OF THE PIPE AND FITTINGS. THE BEDDING SHALL BE TYPE 1 PIPE BEDDING MPWSS 02221(2.1)(A).



2,000 GALLON MONOLITHIC SEPTIC TANK

NO SCALE



TYPICAL SEWER SERVICE

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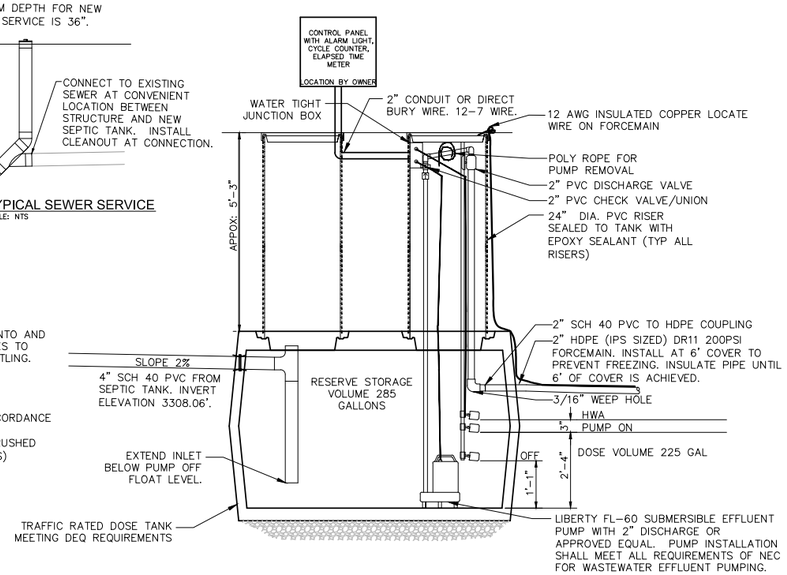

750 GALLON MONOLITHIC DOSE TANK

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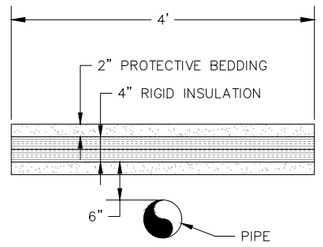
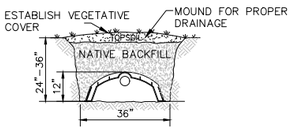
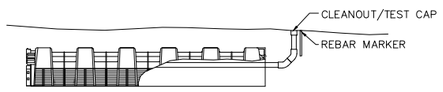


NOTE:
INSULATION SHALL BE 25 PSI EXTRUDED POLYSTRENE, APPROVED FOR SUBGRADE USE

INSULATION DETAIL

NO SCALE





ABSORPTION TRENCH DETAIL

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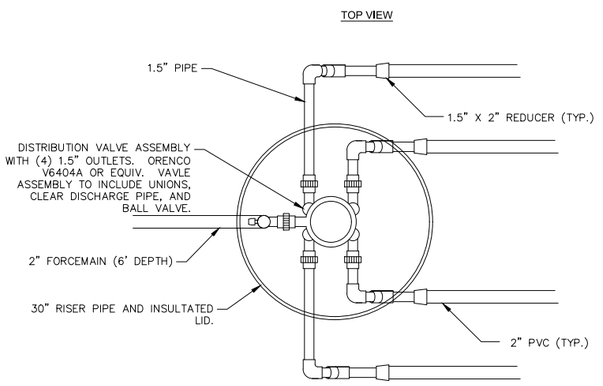


DISTRIBUTION VALVE DETAIL

NO SCALE

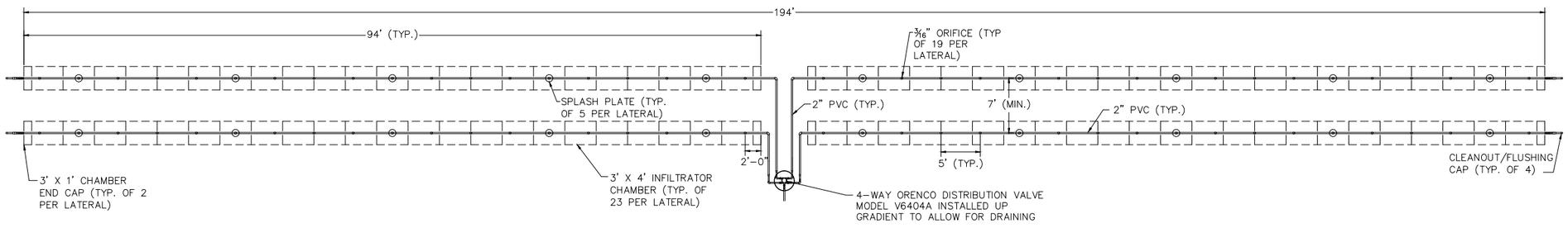
DISTRIBUTION VALVE NOTES

1. PROVIDE ANY ADDITIONAL FITTINGS REQUIRED FOR DISCHARGE PIPE ALIGNMENT, PIPE AND FITTINGS TO BE 1.5" DIA.

2. OUTLET PIPES TO BE SLOPED TO DRAIN TO DRAINFIELD ZONES. MINIMUM SLOPE IS 2%.

3. PROVIDE SUPPORT FOR DISTRIBUTION VALVE IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

4. TEST DISTRIBUTION VALVE TO SHOW PROPER CYCLING OF ALL ZONES IN PRESENCE OF ENGINEER.



DRAINFIELD LAYOUT

NO SCALE

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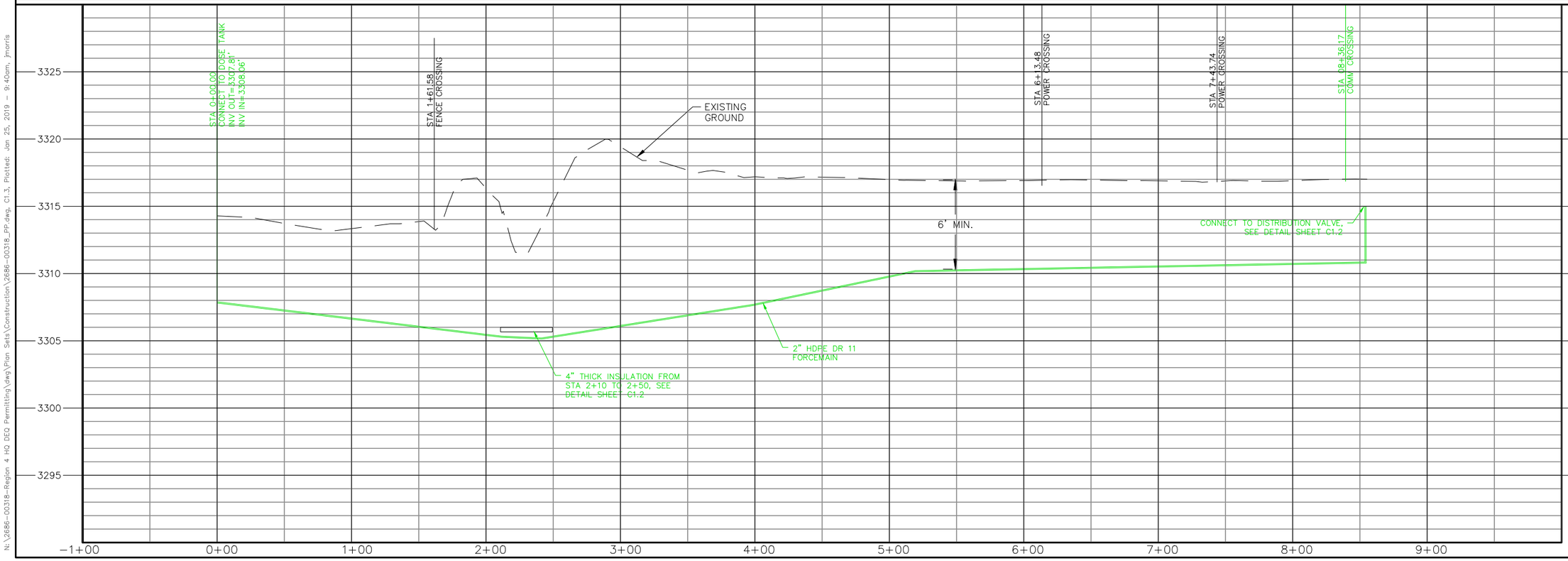
MT FWP REGION 4 HEADQUARTERS

SPARK ARCHITECTURE GREAT FALLS, MT

DETAILS

DESIGNED: PDH
DRAWN: PDH
DATE: 1/15/2019

SHEET
C1.2



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SPARK ARCHITECTURE GREAT FALLS, MT

SEWER PLAN & PROFILE

DESIGNED: PDH
DRAWN: PDH
DATE: 1/15/2019

SHEET
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WATER SYSTEM AND PIPING NOTES

1. ALL WATER DISTRIBUTION MATERIALS, INSTALLATION AND CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE CURRENT MONTANA PUBLIC WORKS STANDARDS SPECIFICATIONS (MPWSS).

2. CONSTRUCTION AND MATERIALS OF WATER PIPE, FITTINGS AND VALVES SHALL CONFORM TO THE LATEST STANDARDS ISSUED BY AWWA & ANSI/NSF. PVC PIPE SHALL MEET ASTM D2241 WITH AN SDR OF 26 (CLASS 160). HYDROSTATIC TESTING SHALL BE IN CONFORMANCE WITH AWWA C600, LAST FOR 2 HOURS AND BE TESTED TO AT LEAST 90 PSI (MINIMUM OF 1.5 TIMES THE NORMAL OPERATING PRESSURE).

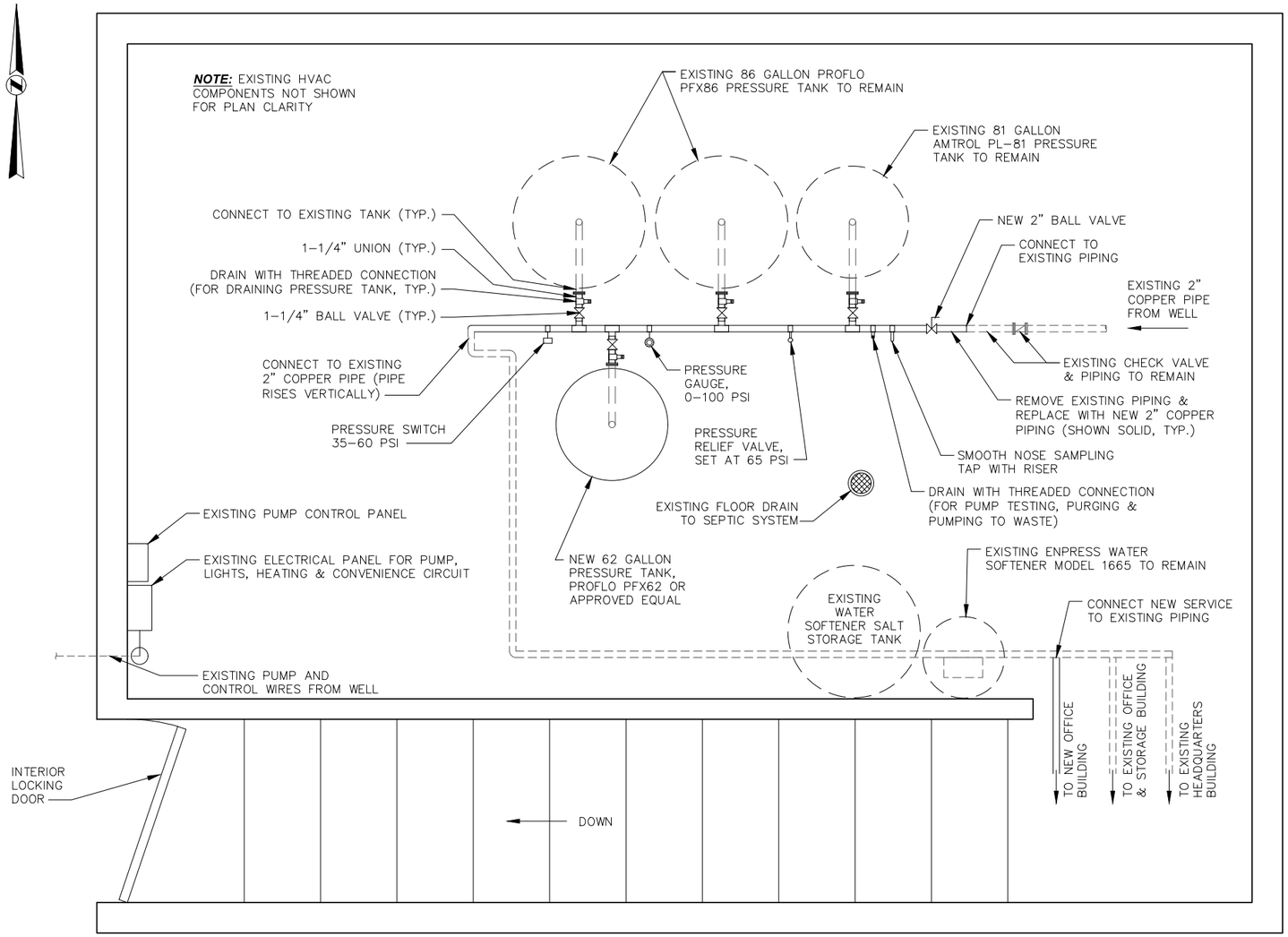
3. WATER MAIN DISINFECTION SHALL BE IN ACCORDANCE WITH THE UNIFORM PLUMBING CODE.

4. CONTRACTOR SHALL ARRANGE FOR BIOLOGICAL POTABLE WATER TEST OF MAINS AND FURNISH THE RESULTS TO THE ENGINEER.

5. ACTUAL PIPING MAY VARY FROM SHOWN. OWNER/INSTALLER TO COORDINATE ACTUAL LAYOUT, SUBJECT TO ENGINEER APPROVAL.

6. IMPROVEMENTS SHALL NOT BE COVERED UNTIL INSPECTED AND APPROVED BY THE REGISTERED PROFESSIONAL ENGINEER RESPONSIBLE FOR CERTIFYING COMPLIANCE WITH THE APPROVED PLANS AND SPECIFICATIONS.

7. CONSTRUCTION TO BE IN ACCORDANCE WITH ALL STATE ADOPTED CODES, BY A LICENSED PLUMBER.



EXISTING CONTROL ROOM & PIPING MODIFICATION SCHEMATIC

NO SCALE

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ISSUE/REVISION

No.	DATE	BY
1	1-15-19	GDW
DESCRIPTION: MDEQ SUBMITTAL		
2		
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MT FWP REGION 4 HEADQUARTERS
SPARK ARCHITECTURE GREAT FALLS, MT

WATER PLAN

DESIGNED: PDH
DRAWN: PDH
DATE: 1/15/2019

SHEET
C1.4